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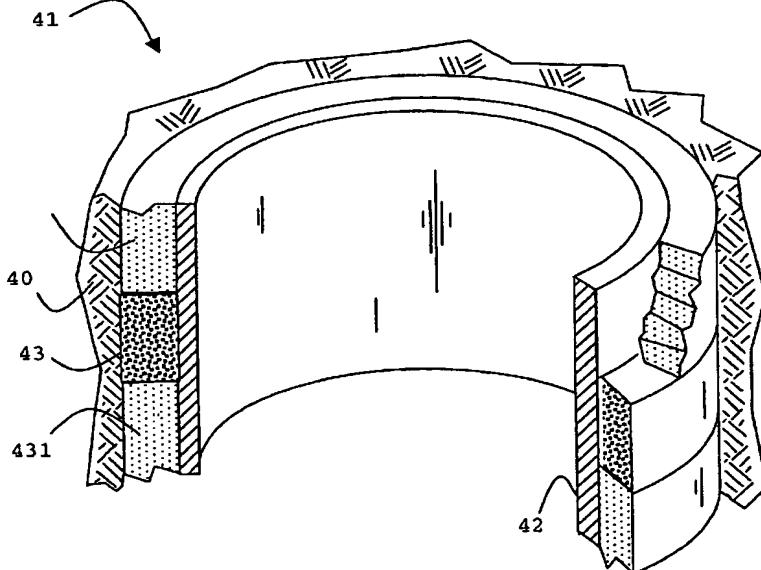
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[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR MAINTAINING ZONAL ISOLATION IN A WELLBORE



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(57) Abstract: The invention concerns a system or a method for maintaining zonal isolation in a wellbore. According to the invention, the system comprises, at a specific location along said wellbore, a sealing element (43), said sealing element being able to deform both during and after placement and is maintained after placement under compression through a pressurising fluid or by confinement in a volume (431).



AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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# INTERNATIONAL SEARCH REPORT

International Application No

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**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 E21B33/10 E21B23/06 E21B33/12

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 231 282 A (NORRIS) 11 February 1941 (1941-02-11)  page 2, left-hand column, lines 45-72 ----- US 6 286 603 B1 (PARENT) 11 September 2001 (2001-09-11)  column 2, line 51 - line 62 column 4, line 39 - line 41 ----- -/-	1,2,6, 13, 15-18, 34,36
X		1,2,13, 15-18, 34,36, 37,41, 47,51,53

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

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- "E" earlier document but published on or after the international filing date
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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PCT/GB2004/000575

**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 041 858 A (ARIZMENDI) 28 March 2000 (2000-03-28)  column 3, line 34 - line 45 column 3, line 58 - line 61 column 4, line 26 - line 45 column 5, line 35 - line 46 column 6, line 34 - line 36 -----	1,4, 6-10, 15-18, 35,36,54
X	US 5 358 054 A (BERT) 25 October 1994 (1994-10-25) column 5, line 45 - line 54 -----	1,4,5, 15-19,36
X	US 1 336 738 A (FLETCHER)  page 1, line 98 - line 106 -----	1,23,31, 36,41
X	WO 01/98627 A (SOFITECH NV ET AL.) 12 December 2002 (2002-12-12) page 2, line 16 - line 21 page 3, line 16 - line 23 -----	1,36,44
X	US 6 059 033 A (ROSS ET AL.) 9 May 2000 (2000-05-09) column 11, line 40 - line 54 -----	1,36
X	US 4 137 970 A (LAFLIN ET AL.) 6 February 1979 (1979-02-06) column 4, line 29 - line 33 column 4, line 55 - line 62 column 5, line 7 - line 20 -----	36,39
X	US 3 272 517 A (HOWARD ET AL.) 13 September 1966 (1966-09-13) column 3, line 65 - column 4, line 22 -----	1,13
A	US 3 750 750 A (URBANOVSKY) 7 August 1973 (1973-08-07) column 2, line 59 - column 3, line 2 -----	27-29, 42,43,50
X	WO 02/28560 A (OBI CORPORATION) 11 April 2002 (2002-04-11)  page 5, line 1 - line 12 page 13, line 10 - line 18 -----	1,5-7, 9-12, 15-19, 23,31, 36,41
P,X	US 2003/178204 A1 (ECHOLES ET AL.) 25 September 2003 (2003-09-25) abstract -----	1,23,31, 41
P,X	US 2003/196820 A1 (PATEL) 23 October 2003 (2003-10-23) paragraph [0027] -----	1,34,37, 47

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB2004/000575

### Box II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-54

#### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-54

System and method for zonal isolation

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2. claims: 55-56

Wellbore fluid

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International Application No

PCT/GB2004/000575

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 2231282	A	11-02-1941	NONE		
US 6286603	B1	11-09-2001	CA GB	2298121 A1 2347702 A ,B	04-08-2001 13-09-2000
US 6041858	A	28-03-2000	NONE		
US 5358054	A	25-10-1994	CA	2118969 A1	29-01-1995
US 1336738	A		NONE		
WO 0198627	A	27-12-2001	GB AU WO US	2363810 A 6255501 A 0198627 A1 2004016543 A1	09-01-2002 02-01-2002 27-12-2001 29-01-2004
US 6059033	A	09-05-2000	US US	5971070 A 6056061 A	26-10-1999 02-05-2000
US 4137970	A	06-02-1979	NONE		
US 3272517	A	13-09-1966	NONE		
US 3750750	A	07-08-1973	NONE		
WO 0228560	A	11-04-2002	US AU CA GB WO	6530574 B1 9663401 A 2463052 A1 2384202 A ,B 0228560 A2	11-03-2003 15-04-2002 11-04-2002 23-07-2003 11-04-2002
US 2003178204	A1	25-09-2003	NONE		
US 2003196820	A1	23-10-2003	NO CA GB	20031775 A 2425725 A1 2387863 A ,B	20-10-2003 17-10-2003 29-10-2003